

Application No. 10/810,183
Response to Office Action

Customer No. 01933

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

New claims 16-21 have been added to more clearly and positively recite the features of the present invention as shown, for example, in Figs. 1-3 and as described in the specification at, for example, pages 6-21.

No new matter has been added, and it is respectfully requested that new claims 16-21 be approved and entered.

THE PRIOR ART REJECTION

Claims 1, 4, 5 and 9-12 were rejected under 35 USC 102 as being anticipated by US 2003/0063376 ("Shimizu et al"); claims 1, 2 and 9 were rejected under 35 USC 102 as being anticipated by USP 6,243,197 ("Schalz"); claims 1 and 2 were rejected under 35 USC 102 as being anticipated by US 2003/0086145 ("DeSimone et al"); and claims 4, 5 and 9-12 were rejected under 35 USC 103 as being obvious in view of DeSimone et al. These rejections, however, are all respectfully traversed with respect to new claims 16-21 as set forth hereinabove.

According to the present invention as recited in each of new independent claims 16 and 19, illumination light is reflected

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onto a digital micromirror device which is conjugate with a specimen via a field stop projection lens and an objective, and which comprises a plurality of two-dimensionally arrayed micromirrors that are individually selectable to be turned on so as to reflect light toward along an illumination axis to the sample, and a shutter is provided that is capable of blocking light with respect to the sample.

According to new independent claim 16, before picking up an image of the specimen, all of the micromirrors are turned on, and the shutter is opened to cause the illumination light to be guided to the specimen via the turned-on micromirrors, such that an image of a part of the specimen that is located within the field of view is picked up by a camera, and wherein the shutter is closed after an image pick-up operation of the camera ends. As recited in new independent claim 16, the image picked up by the camera is then displayed by the monitor, an irradiation area to be irradiated with the illumination light is specified, and ones of the micromirrors which correspond to the specified irradiation area are specified. And as recited in new independent claim 16, before picking up an image of the sample again, only the specified ones of the micromirrors are turned on, and the shutter is opened to cause the illumination light to be guided to the specimen via the turned-on micromirrors, such that another image of the part of the specimen that is located within the

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field of view is picked up by the camera, and wherein the shutter is closed after the image pick-up operation of the camera ends.

In addition, according to the present invention as recited in new independent claim 19, before picking up an image of the specimen, desired ones of the micromirrors are turned on, and the shutter is opened to cause the illumination light to be guided to the specimen via the turned-on micromirrors, and wherein the shutter is closed after an image pick-up operation of the camera ends, to cut off stray light from ones of the micromirrors that are not turned on.

With these structures, the microscope of the claimed present invention shields cells of the specimen from stray light generated by off-state micromirrors, thereby preventing the stray light from being radiated on and adversely affecting the cells. In addition, since a fluorescent material of the specimen is illuminated only during the image pick-up operation of the camera, the cells are not greatly damaged, and the specimen can be satisfactorily observed with a good-contrast image.

It is respectfully submitted that none of the prior art references of record discloses, teaches or suggests the above described structural features and advantageous effects of the present invention as recited in new independent claims 16 and 19.

In particular, it is noted that Shimizu et al discloses a digital micro-mirror device 20 which may be used as a shutter by

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controlling all of the micro-mirrors to be off to block light
(paragraph [0058]). Clearly, therefore, Shimizu et al does not disclose a digital micromirror device and a shutter as recited in new independent claims 16 and 19, whereby micromirrors can be turned on while the shutter is off.

In addition, it is noted that Schalz discloses an LCD 5 for optical deflection wherein the LCD can be replaced by a DMD, but this reference clearly does not disclose, teach or suggest a DMD and separate shutter in the manner of the claimed present invention.

Still further, it is noted that DeSimone et al discloses a DMD 48 and a shutter 82, wherein the shutter 82 is merely a manually operable shutter provided in a light source mount 44. And it is respectfully submitted that DeSimone et al does not disclose, teach or suggest shutter and micromirror coordination as according to the present invention as recited in new independent claims 16 and 19.

With respect to the other cited references, it is noted that USP 6,128,077, USP 5,587,832 and USP 6,483,641 do not disclose apparatuses with both DMD's and shutters, and it is respectfully submitted that US 2004/0047034 and US 2004/0061914 also do not disclose DMD shutter and DMD coordination as according to the present invention as recited in new independent claims 16 and 19.

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In view of the foregoing, it is respectfully submitted that the present invention as recited in new independent claims 16 and 19, and new claims 17-18 and 20-21 respectively depending therefrom, clearly patentably distinguishes over all of the prior art references of record, taken singly or in any combination, under 35 USC 102 as well as under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

/Douglas Holtz/

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